

61. A new Family of Spiders.

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(Plate I. † ; Text-figures 1-6.)

The present paper deals with a spider possessing several remarkable features which seem to justify the establishment of a new family. The name Symphytognathidae (Greek : *συνεπυτος* = grown together, *γναθος* = jaw) is suggested.

The most noteworthy characteristics are :—

- (1) the complete absence of book-lungs,
- (2) the possession of only a single pair of tracheal spiracles,
- (3) the fusion of the chelicerae,
- (4) the complete absence of the palpi in the female both in immature and mature forms,
- (5) the presence of only six eyes.

The first specimen, a female, was found on 5th May, 1928, among a number of small spiders collected by beating gorse (*Ulex europaeus*) at the Punch Bowl, Launceston, Tasmania. Possessing only a single specimen, I was unable to determine all its structural features with certainty. However, during May and June 1930, I collected fourteen specimens of the spider at the same locality. These included five males and nine females, but only two of the males and six of the females were fully developed. All the males possessed palpi, but the females lacked them. In order to make quite sure of this unusual absence of the palpi, three of the female specimens were softened in caustic-potash solution and carefully dissected under the microscope, but not even a rudiment of the palpi could be discovered.

The pars cephalica is high. The chelicerae are large, powerful, and inserted well above the mouth. They are firmly united for almost their whole length. The spider has only six eyes, the median pair of which are contiguous and widely separated from the lateral eyes. The legs are short, but their tarsal segments are relatively long. They are clothed with barbed setae, and end in three claws. Trichobothria are present on the tibia and metatarsus of each leg, but not on the other segments. The spinnerets and anal tubercle resemble those of *Theridion*.

The presence of a single pair of tracheal spiracles and the complete absence of book-lungs are most unusual features. The spiracles are placed one on each side of the epigynum. The abdomen of a female specimen which had been softened in caustic-potash solution was dissected and stained in hamatoxylin. In this way the tracheae were rendered quite conspicuous and the absence of book-lungs confirmed.

Other characteristics of the family will be found in the following detailed descriptions of the species on which the family has been established.

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† For explanation of the Plate, see p. 1328.

Suborder ARACHNOMORPHÆ.

Branch *TRIONYCHA*.

Family SYMPHYTOGNATHIDÆ, nov.

SYMPHYTOGNATHA GLOBOSA, gen. et sp. n.

The following types, holotype ♂ and allotype ♀, have been deposited in the Queen Victoria Museum, Launceston, Tasmania.

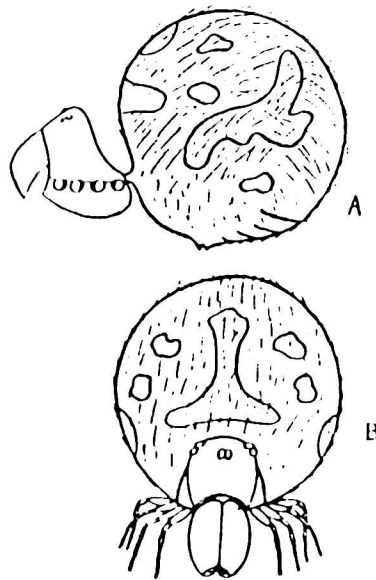
Male.—Measurements of holotype ♂ (in millimetres) :

Total length	1.07
Length of cephalothorax (plus chelicere)	0.46
Width of cephalothorax	0.39
Height of cephalothorax	0.28
Length of abdomen	0.68
Width of abdomen	0.71
Height of abdomen	0.74

Leg.	Femur.	Patella.	Tibia.	Metatarsus.	Tarsus.	Total.
1	0.27	0.14	0.18	0.14	0.18	0.91
2	0.25	0.14	0.18	0.14	0.18	0.89
3	0.21	0.11	0.15	0.12	0.18	0.77
4	0.25	0.14	0.19	0.14	0.22	0.94

Cephalothorax.—Brown, with lateral markings of darker brown ; very high and sloping steeply down under the anterior part of the abdomen, as in the female (see text-fig. 1, A). Sides rounded. Pars cephalica is furnished with

Text-figure 1.

*Symphytognatha globosa*, gen. et sp. n.

A. Side view of female. B. Front view of female

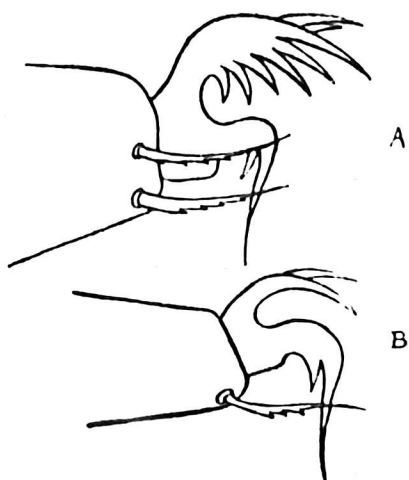
ten long bristles which are curved towards the front. The bristles are placed as follows :—one near the inner edge of each of the lateral eyes, one immediately in front and one in rear of the median eyes, and four in a transverse row behind the ocular area.

Eyes.—Six, subequal in size, pearly white surrounded with black rims. From above they appear as ovals. The two middle eyes are contiguous, and the front and rear laterals are also contiguous. The front laterals are poised obliquely. The middle eyes are on a line which passes between the front and rear laterals. The space which separates the middle eyes from the laterals is equal to seven-fifths of the long diameter of a middle eye.

Clypeus.—Steep and high. The distance from the front edge of the middle eyes to the base of the chelicerae is equal to five-eighths of the long diameter of a middle eye.

Legs 4. 1. 2. 3, brown in colour and lightly clothed with coarse hairs. There is a distinct protuberance on the retrolateral side of each patella. The first pair of legs are slightly stouter than the others. There is a single trichobothrium on the dorsal side near the base of each metatarsus and two or three trichobothria in a similar position on each tibia. The setae clothing the legs are barbed, those on the under surface of the tarsi and metatarsi of the third

Text-figure 2.



Symphytognatha globosa.

- A. Tarsal claws of second pair of legs in female.
B. Tarsal claws of third pair of legs in female.

and fourth pairs of legs are larger and more coarsely barbed than the others. Three tarsal claws are present. The superior claws of the first and second tarsi are provided with five or six long teeth, those of the third and fourth tarsi are without teeth. The inferior claw of each tarsus is bent at a right angle and produced into a long thin point; it is furnished with a single tooth. The tarsi are also furnished with spurious claws in the form of serrated bristles (text-fig. 2).

Spines.—Two spines are present on the underside of the tarsus and one on the underside of the metatarsus of the first pair of legs. Elsewhere none.

Palpi.—Brown, short, and have the form shown in text-fig. 3. The cymbium is a slightly concave disc. The genital bulb is rounded and faces outwards and upwards. It is surrounded by one complete turn of the embolus.

Chelicerae.—Large, brown, prominent, and fused. They are attached well above the mouth and are furnished with a few barbed setae. Lateral condyle absent. Fang short and curved; promargin of furrow armed with

a long sinuous tooth, and a similar tooth is placed almost opposite to it on the retromargin. Between these two long teeth is a short conical tooth. When the fang is not extended its tip rests between the two long teeth.

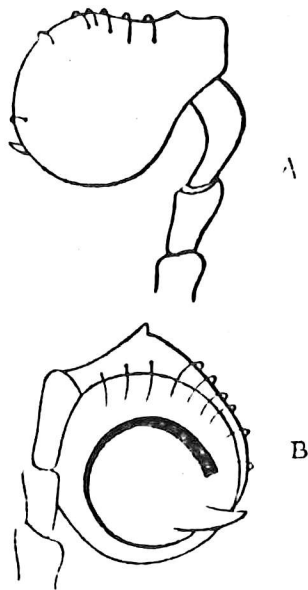
Labium.—Brown, much wider than long, rounded in front; not movable, but fused with the sternum, although a slight line of separation is traceable.

Maxilla.—Strongly converging, subtriangular in outline, inner angle sharp and furnished with a tuft of finely barbed hairs. A well-developed serrula is present.

Sternum.—Dark brown, oval, longer than broad in ratio 3 : 2. Strongly convex and clothed with coarse setae, which are curved inwards towards the middle line. The rear coxae are widely separated.

Abdomen.—Almost spherical. Its anterior portion overhangs the rear of the cephalothorax. Greyish black in colour and marked with irregular dirty

Text-figure 3.



Symphytognatha globosa.

A. Male palpus viewed from inner side.

B. Male palpus viewed from outer side.

white patches and spots. Above the spinnerets it is marked with four dirty white recurved bars. The clothing consists of dark-coloured hairs, which under high magnification are seen to be barbed. Book-lungs are absent, their place being taken by a single pair of tracheal spiracles in front of the epigastric furrow and separated by about half the width of the abdomen.

Spinnerets.—Six, the anterior pair conical, stouter and longer than the others. The middle pair very small. The posterior pair larger than the middle pair. In their arrangement the spinnerets resemble those of *Theridion*. No colulus is present. The anal tubercle is large and crescent-shaped.

Lyriiform Organs.—These organs are large and numerous. In transparent preparations they were readily found on the trochanter, femur, patella, tibia and metastarsus of each leg. A very large pair are placed one on each side of the pedicel of the abdomen (see Pl. I. fig. 1).

Female.—Measurements of allotype ♀ (in millimetres) :

Total length	1.39
Length of cephalothorax (plus chelicerae)	0.50
Width of cephalothorax	0.42
Height of cephalothorax	0.28
Length of abdomen	0.93
Width of abdomen	0.96
Height of abdomen	0.96

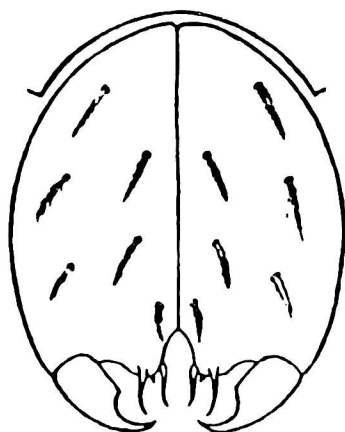
Leg.	Femur.	Patella.	Tibia.	Metatarsus.	Tarsus.	Total.
1	0.29	0.15	0.18	0.15	0.19	0.95
2	0.26	0.15	0.16	0.14	0.19	0.90
3	0.22	0.15	0.14	0.14	0.19	0.84
4	0.32	0.16	0.21	0.15	0.23	1.07

Cephalothorax.—Brown in colour ; high, its highest point being immediately in rear of the eyes, and from this point it slopes steeply towards the rear and under the front of the abdomen. In front of the eyes it slopes almost as steeply to the base of the chelicerae. Thoracic groove absent ; radial grooves faintly marked. A few long barbed setae project from the pars cephalica and clypeus.

Clypeus.—High, sloping steeply to the front, furnished round the margin with a row of six or seven setae. The distance from the median eyes to the base of the chelicerae is equal to a little more than twice the long diameter of a median eye.

Eyes.—Six. The two median eyes are oval and contiguous. They are separated from the lateral eyes by a space equal to one and a half times their own long diameter. The lateral eyes are contiguous, slightly smaller than

Text-figure 4.



Symphytognatha globosa.

Chelicerae of female. Front view.

the median eyes, and mounted on a small elevation. The centres of the median eyes are on a line which passes between front and rear laterals.

Chelicerae. Large and strong, fused, projecting forward, convex in front, and clothed with a few setae. Lateral condyle and stridulating ridges absent. Fang is short and curved. The promargin and retromargin of the furrow are each armed with a long sinuous tooth, and between the two long teeth is a short conical tooth mounted on a tubercle (text-fig. 4).

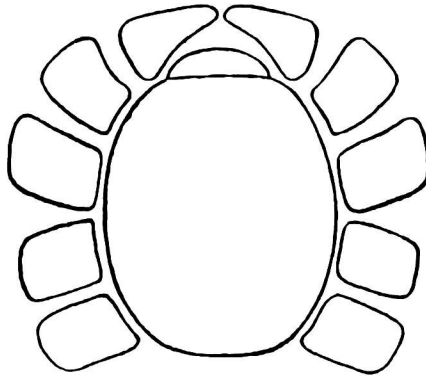
Maxillæ.—Subtriangular, strongly converging, provided with a serrula and a tuft of barbed hairs at the inner angle (text-fig. 5).

Labium.—Wider than long, rounded in front, not movable, fused to the sternum but displaying a slight line of separation (text-fig. 5).

Sternum.—Oval, dark brown, strongly convex, longer than wide in ratio 5 : 4, truncate in rear, lightly clothed with setæ, which are curved towards the centre line. The rear coxæ are widely separated (text-fig. 5).

Legs 4 . 1 . 2 . 3, brown, lightly clothed with coarse setæ. No spines are present, but at the base of each tibia and at the apex of each patella on the dorsal side is a strong erect bristle. There is a slight retrolateral protuberance on each patella, but it is not as strongly developed as in the male. A single trichobothrium is found on the dorsal side of each metatarsus and three on each tibia, but none on other segments of the legs. The setæ on the legs are barbed, those on the ventral side of the tarsi are thicker than the others and furnished with longer barbs. Moreover, these barbs seem to be confined to one side of the setæ. Three tarsal claws are present. The superior claws of the first and second tarsi are armed with six teeth, those of the third and fourth tarsi are without

Text-figure 5.



Symphytognatha globosa.

Sternum, labium, and maxillæ in female.

teeth. The inferior claw of each leg is bent at a right angle and ends in a long fine point. It is armed with a single tooth. The tarsi are also provided with spurious claws in the form of serrated bristles (text-fig. 2).

Spines.—No spines are present on any of the legs.

Palpi.—It has already been mentioned that the female is devoid of palpi.

Abdomen.—Almost spherical in shape (text-fig. 1, A and B) and marked as in the male. It is lightly clothed with dark-coloured hairs, which are barbed. The epigynum is difficult to see owing to the globose abdomen bringing it almost into contact with the end of the sternum. When, however, the abdomen is removed the epigynum is seen to consist of two small subpyriform depressions. The form of the reproductive system when seen in transparent preparations is shown in Pl. 1, fig. 2 and text-fig. 6. Book-lungs are absent, their place being taken by a single pair of tracheal spiracles situated one on each side of the epigynum and in front of the epigastric furrow. The tracheæ of the two sides are connected by a wide transverse tube (text-fig. 6).

Spinnerets and Lyriform Organs as in the male.

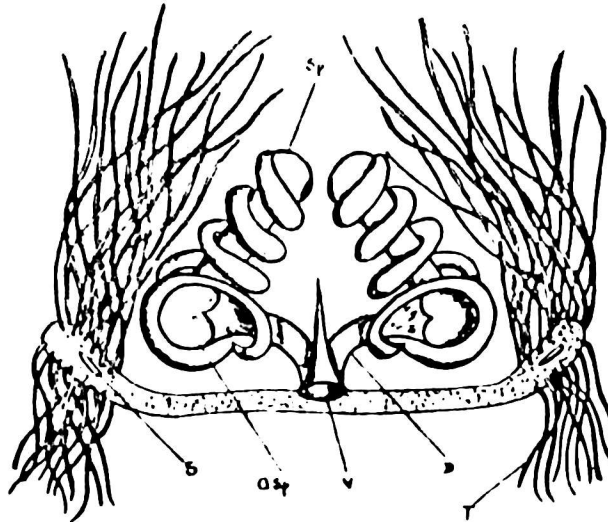
Habits.—This little spider makes a small irregular web like that of *Theridion*. It is generally placed at the base of dry grass tussocks or low shrubs. The

spider rests in the web in an inverted position. A female specimen which I kept in a glass tube for some weeks made an egg-sac of remarkable form and of great beauty (Pl. I. fig. 3). The sac is made of pure white silk and has the shape of a cone, the surface of which is decorated with three annular rows of fine radiating points of silk. The periphery of the base of the cone is produced into about fifteen similar silken points which are placed at regular intervals, and five or six points project from the centre of the base. The cone is 1.82 mm. in height, and the diameter of the base is 1.32 mm. The sac is generally suspended from a grass stalk near the web. It contains only a single egg, and is usually found in grass tussocks during the months of August and September.

Locality.—The Punch Bowl, Launceston, Tasmania.

Affinities of the Symphytognathidae.—The systematic position of the family presents a difficult problem. The complete absence of book-lungs is a characteristic shared by the Caponiidae and Telemidae, but these families possess two pairs of tracheal spiracles. If the present family has originated from either the Caponiidae or Telemidae by the suppression of a pair of tracheal spiracles,

Text-figure 6.



Symphytognatha globosa. Tracheae and epigynum of female as seen in transparent preparations.

V., vagina; Sp., spermatheca; O.sp., opening of spermatheca; D., tube leading from spermatheca to vagina; T., tracheae; S., spiracle.

we might expect it to have a reasonable number of other characteristics in common with these families. This, however, is not the case. On the other hand, we find considerable affinity with the Archæidae in the elevated pars cephalica, the insertion of the chelicerae well above the mouth, the absence of the lateral condyle, the presence of serrated bristles on the tarsi, the absence of claw-tufts and of trichobothria on the tarsi, and in the presence of three tarsal claws. In addition the female palpus in *Archæa* is very small and inserted on the dorsal surface of the maxilla. Perhaps this atrophy of the palpus foreshadows the complete loss of the appendage, which has taken place in the spider under consideration. Moreover, the eyes are reduced to six as in *Mecysmauchenius*, a genus of the Archæidae.

The fusion of the chelicerae is not found in the Archæidae, but occurs in the Sicariidae, Pholcidae, and Ammoxenidae.

The spider shows some relationship with the Theridiidae in the form of the

spinnerets and epigynum, in the globose shape of the abdomen, and in the habit of spinning an irregular web, from which it hangs in an inverted position.

I am inclined to think that the new family is an offshoot of the Archæidæ in which the book-lungs have become suppressed and the tracheal system highly developed, rather than that it is an offshoot of the Caponiidæ or Telenidæ in which one pair of tracheal spiracles has been lost. T. H. Savory, in his book 'The Biology of Spiders,' 1928, p. 307, says, in reference to the Arachnomorphæ, "The existence of diverse types of respiratory systems in this subgroup shows that these organs cannot be regarded as of great systematic value." The characteristics of the spider described in the present paper help to confirm this statement, and I suggest that the new family, Symphytognathidæ, be placed near the Archæidæ.

Characters of the Symphytognathidæ, fam. nov.

Arachnomorphæ in which the respiratory system consists of a single pair of spiracles leading into tracheal tubes. The spiracles are situated near the epigastric furrow. Book-lungs are absent. Chelicerae fused for their whole length. Lateral condyle wanting. Maxillæ strongly converging over an immobile labium. Legs short and clothed with barbed setæ. Trichobothria on metatarsi and tibiæ, elsewhere absent. Tarsi furnished with serrated bristles and three claws. Cribellum and calamistrum wanting. Lyriform organs large. Six spinnerets.

SYMPHYTOGNATHA, gen. nov.

Cephalothorax high. Six eyes. The median pair of eyes close together and widely separated from the lateral eyes.

Legs 4.1.2.3. Palpi absent in female, present in male. Chelicerae large and inserted well above the mouth. The promargin and retromargin of furrow armed with a long sinuous tooth. Rear coxæ widely separated. Abdomen large and spherical, clothed with barbed hairs.

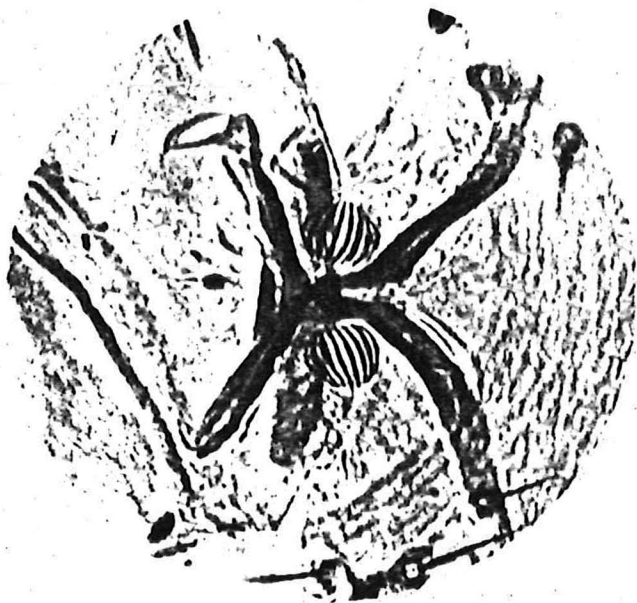
Spinnerets and anal tubercle as in *Theridion*.

Genotype, *Symphytognatha globosa*.

EXPLANATION OF THE PLATE.

PLATE I.

- Fig. 1. Photomicrograph of the paired lyriform organs ($\times 340$), one on each side of the pedicel of the abdomen in the male of *Symphytognatha globosa*.
 2. Photomicrograph of the epigynum and reproductive system (> 230) of the female of *Symphytognatha globosa*, as seen in transparent preparations.
 3. The egg-sac ($\times 15$) of *Symphytognatha globosa*.



1.



2.



3.